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306504

December, 2019

B.Tech. (ECE/EIC)- V SEMESTER

Virtual/Intelligent Instrumentation (EIEL503/OEL503)

Time : 3 Hours] [Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART - A

1. (a) What are various elements of an intelligent instrument? (1.5)

(b) What is software based instrumentation. Explain the role of microcontroller? (1.5)

(c) What are the differences between a sensor and a transducer? (1.5)

(d) Built a VI to find factorial of a number. (1.5)

(e) Explain the advantages of graphical programming based software like LABVIEW. (1.5)

(f) What are the interfacing methods of connecting DAQ Devices to Computers? (1.5)

(g) Built a VI to find the sum of array elements. (1.5)

(h) What is the role of filters in signal analysis? (1.5)

(i) Differentiate between IIR and FIR filters. (1.5)

(j) Explain signal leakage problem in long segmentation of signal. How it can be rectified? (1.5)

PART - B

2. (a) What is intelligent instrumentation? What do you understand by dump and intelligent instruments? Explain with Example. (10)

(b) Discuss the data flow and graphical programming techniques in virtual instrumentations. Also write their limitations. (5)

3. (a) Draw the bus diagram of RS232 in serial interfacing. Explain the working of it with suitable example. (5)

(b) Explain optical fibre communication system with the help of block diagram. Enlist down its advantages and disadvantages. (10)

4. Describe VIs and sub-VIs used in LabVIEW. Create a VI to select between two input clusters using a toggle switch and display in an output cluster. (15)

5. (a) A 8 bit D/A Converter has a referenced voltage of 12 V. It uses a weighted resistive network. Find the minimum value of resistance R to be connected to MSB input circuit such that maximum output current does not exceed 10 mA. Find the smallest quantified value of current. (5)

(b) Explain about VI's loops, charts, arrays, graphs, clusters. (10)

6. (a) Explain wait state generator implementation required for memory interfacing in detail. (5)

(b) Discuss various types of signals used in memory decoding while microprocessor interfacing. Also draw timing diagram of each of them. (10)

7. Write short notes on :

(i) Wavelets.

(ii) Clusters in VI.

(iii) Network Topologies. (15)
